

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
REQUEST FOR FILING NATIONAL PHASE OF  
PCT APPLICATION UNDER 35 U.S.C. 371 AND 37 CFR 1.494 OR 1.495

To: The Commissioner of Patents and Trademarks  
Washington, D.C. 20231  
(Our Deposit Account No. 03-3975  
(Our Order No. 12199 /237370  
C# / M#

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)

Atty. Dkt. 237370 /C92961-BGC/JB/AN  
M# / Client Ref.

From: Cushman Darby & Cushman

Date: April 11, 1997

This is a **REQUEST** for **FILING** a PCT/USA National Phase Application based on:

1. International Application  
PCT/ NO95 / 00183  
↑ country code
2. International Filing Date  
9 October 1995  
Day MONTH Year
3. Earliest Priority Date Claimed  
12 October 1994  
Day MONTH Year  
(use item 2 if no earlier priority)
4. Measured from the earliest priority date in item 3, this PCT/USA National Phase Application Request is being filed within:  
(a) [ ] 20 months from above item 3 date (b) [XX] 30 months from above item 3 date,  
(c) Therefore, the due date (unextendable) is April 12, 1997
5. Title of Invention METHOD; APPARATUS AND IGNITION DEVICE FOR IGNITION OF INFLAMMABLE GASES FROM A FLARE ON E.G. A FLAME TOWER
6. Inventor(s) ODEMARK, Tom et al

Applicant herewith submits the following under 35 U.S.C. 371 to effect filing:

7. [ X ] Please immediately start national examination procedures (35 U.S.C. 371(f)).
8. [ ] A copy of the International Application as filed (35 U.S.C. 371(c)(2)) is transmitted herewith (file if in English but, if in foreign language, file only if not transmitted to PTO by the International Bureau) including:  
a. [ ] Request;  
b. [ ] Abstract;  
c. \_\_\_\_\_ pgs. Spec. and Claims;  
d. \_\_\_\_\_ sheet(s) Drawing which are [ ] informal [ ] formal of size [ ] A4 [ ] 13" [ ] 14"
9. [ X ] A copy of the International Application has been transmitted by the International Bureau.
10. A translation of the International Application into English (35 U.S.C. 371(c)(2))  
a. [XX] is transmitted herewith including: (1) [ ] Request; (2) [XX] Abstract;  
(3) 12 pgs. Spec. and Claims;  
(4) 3 sheet(s) Drawing which are:  
[ ] informal [XX] formal of size [XX] A4 [ ] 11"  
b. [ ] is not required, as the application was filed in English.  
c. [ ] is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.  
d. [ ] Translation verification attached (not required now).
11. [ X ] PLEASE AMEND the specification before its first line by inserting as a separate paragraph:  
--This application is the national phase of international application PCT/ NO95 /00183  
filed October 9, 1995 which designated the U.S.--

12. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., before 18th month from first priority date above in item 3, are transmitted herewith (file if in English but, if in foreign language, file only if not transmitted by the International Bureau) including:
13. ☒ PCT Article 19 claim amendments (if any) have been transmitted by the International Bureau.
14. ☐ Translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., of claim amendments made before 18th month, is attached (required by 20th month from the date in item 3 if box 4(a) above is X'd, or 30th month if box 4(b) is X'd, or else amendments will be considered cancelled).
15. **A declaration of the inventor** (35 U.S.C. 371(c)(4))  
 a. ☒ is submitted herewith ☐ Original ☒ Facsimile/Copy  
 b. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.
16. **An International Search Report (ISR):**  
 a. Was prepared by ☐ European Patent Office ☐ Japanese Patent Office ☒ Other  
 b. ☒ has been transmitted by the International Bureau to PTO.  
 c. ☒ copy herewith (1 pg(s).) ☒ plus Annex of family members (1 pg(s).).
17. **International Preliminary Examination Report (IPER):**  
 a. ☒ has been transmitted (if this letter is filed after 28 months from date in item 3) in English by the International Bureau with Annexes (if any) in original language.  
 b. ☒ copy herewith in English  
 c.1 ☐ IPER Annex(es) in original language ("Annexes" are amendments made to claims/spec/drawings during Examination) including attached amended:  
 c.2 ☒ Specification/claim pages # 8, 9 & 10 ☐ Drawing Sheets # \_\_\_\_\_  
 c.3 ☐ Which resulted in cancellation of pages # \_\_\_\_\_ claims # \_\_\_\_\_  
       Dwg Sheets # \_\_\_\_\_  
 d. ☐ Translation of Annex(es) to IPER (required by 30th month due date, or else annexed amendments will be considered cancelled).
18. **Information Disclosure Statement** including:  
 a. ☒ Attached Form PTO-1449 listing documents  
 b. ☒ Attached copies of documents listed on Form PTO-1449  
 c. ☒ A concise explanation of relevance of ISR references is given in the ISR.
19. ☒ **Assignment** document and Cover Sheet for recording are attached. Please mail the recorded assignment document back to the person whose signature, name and address appear at the end of this letter.
20. ☐ Copy of Power to IA agent.
21. ☐ **Drawings:** \_\_\_\_\_ sheet(s) per set: ☐ 1 set informal; ☐ Formal of size ☐ A4 ☐ 11"
22. ☒ 1 (No.) **Verified Statement(s)** establishing "small entity" status under Rules 9 & 27
23. **Priority** is hereby claimed under 35 U.S.C. 119/365 based on the priority claim and the certified copy, both filed in the International Application during the international stage based on the filing in (country) NORWAY of:
- | <u>Application No.</u> | <u>Filing Date</u>     | <u>Application No.</u> | <u>Filing Date</u> |
|------------------------|------------------------|------------------------|--------------------|
| (1) <u>943851</u>      | <u>October 9, 1994</u> | (4) _____              | _____              |
| (2) _____              | _____                  | (5) _____              | _____              |
| (3) _____              | _____                  | (6) _____              | _____              |
- a. ☒ See Form PCT/IB/304 sent to US/DO with copy of priority documents. If copy has not been received, please proceed promptly to obtain same from the IB.  
 b. ☐ Copy of Form PCT/IB/304 attached.
24. Attached:
25. **Preliminary Amendment:**



Method, apparatus and ignition device for ignition of inflammable gases from a flare on e.g. a flame tower

The present invention relates to a method, an apparatus and  
5 an ignition device for igniting combustible gases, for  
example from a flare of a flare tower, where an ignition  
device is launched in a direction toward a region of com-  
bustible gas.

10 With respect to the ignition of gas flows, for example in a  
flare, a distinction may be made between two different  
ignition techniques. One technique is a so-called point  
ignition system, where the gas is ignited only at one point.  
This can be achieved by means of, for example, a match, a  
15 pilot burner or a flame front generator. A prerequisite for  
point ignition is that the gas at the point of ignition has a  
concentration between the lower and the upper detonation  
line. The other technique is a so-called volume ignition  
system, where ignition occurs through sparks being scattered  
20 within a large volume and igniting the gas in this volume.  
The latter technique is thereby a great deal more reliable  
than the point ignition system.

The Norwegian Patent Application No. 932017 teaches a method for the ignition of combustible gas emitted through a flare in a flare tower. The ignition device is in the form of a projectile which is fired in a path in the direction toward the gas outlet. The ignition device strikes an impact plate which is mounted at the location of the gas outlet, whereby the ignition device undergoes a reaction and brings a flow of incandescent particles into the gas flow, which is ignited thereby. Thus, the ignition device is detonated by impact. This method is encumbered with a number of inconveniences, inter alia, the fact that the equipment used is excessively complicated. One of the reasons therefor is that the ignition device is fired by means of very high propulsion gas pressure in the form of a gas pulse, having a pressure at

a magnitude of 260-300 bar. The manner in which the ignition device is fired makes it impossible to stop the ignition device after it is launched, nor is it possible to return the ignition device to the launching means. This prior art  
5 solution makes use of a so-called protective tube having a clearance between the ignition pellet (the projectile) and the bore. All the energy for the pellet is supplied before it enters the protective tube (i.e., a normal shot at high pressure).

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An object of the present invention is to provide a method, an apparatus and an ignition pellet for igniting gases in a flare tower and avoid the disadvantages described above.

15 Another object of the present invention is to provide a device for igniting gases, where the ignition pellet is not launched by high pressure but is guided out of a launching tube which has a continuous supply of propulsion gas.

20 Another object of the invention is to provide a programmable ignition pellet, which may be stopped after it has been set in motion and which may be returned to the launching means.

Yet another object of the present invention is to provide an  
25 ignition pellet which is activated during its movement from the launching means to the flare by means of an electrical or mechanical device which initiates/activates the ignition pellet.

30 That which is particularly achieved by the present invention in relation to the known solution is a controlled and lower speed of the ignition pellet. This entails that the required safety zone surrounding the device can be smaller, and this will also mean that the danger to possible helicopter traffic  
35 near the flare tower will be reduced. Compared with the known solution the present invention will entail far lower investment costs, inter alia because there is only one



The invention also comprises an apparatus for the use of igniting gases in a flare tower or flare by means of an ignition device which is brought toward a region in or near a cloud of gas and which is characterized by a guidance tube and a supply of a pressure medium, where the ignition device is adapted for propulsion through the guidance tube by means of the pressure medium for the purpose of bringing the ignition device close to the cloud of gas for a reaction near or within the cloud of gas.

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Preferably, the apparatus comprises a feeding unit, a control device and, optionally, a magazine for the ignition device.

Preferably, an ignition initiator is mounted somewhere along the guidance tube so as to initiate/activate the ignition device which, after a time delay, undergoes a reaction outside the tube, in or near the cloud of gas.

15

Optionally, the apparatus comprises a trapping device for the ignition device after it has left the tube.

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The invention also comprises an ignition device for use with the apparatus, said device being characterized in that it is in the form of an ignition pellet which is electrically or mechanically activated, said ignition pellet having a built-in delay prior to its reaction, the time for its activation and delay being predetermined and adapted to the particular flare and application.

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In what follows the invention will be described in more detail with reference to the appended drawings.

30

Figure 1 shows a flare having an apparatus for the ignition of gas according to the present invention.

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Figure 2 is a schematic view of a feeding unit and launching means according to the present invention.

Figure 3 shows an embodiment of the upper end of the apparatus according to the present invention.

5 Figure 4 shows another embodiment of the upper end of the apparatus according to the present invention.

Figure 5 shows an embodiment of a activator/electric initiator according to the present invention.

10

Figure 6 shows an embodiment of an electric ignition pellet according to the present invention.

15 In Figure 1 is shown the principle of igniting a gas flow 1 at a flare 2 at the end of a flare tower 3. An ignition pellet 4 is collected from a supply (for example a magazine), is loaded into a launching means 5, is ejected by means of a so-called pneumatic post system through a guidance tube 6, undergoes a reaction at the end of the flare 2 and forms a  
20 cloud of sparks which ignite the gas flow 1 at the flare 2. The ignition pellet 4 is conducted through the guidance tube 6 and will the whole time bear against the tube wall which serves as a guidance and sealing. Thus, the pellet 4 is not fired as it is in the case of the known apparatus.

25

In Figure 2 the main components of the apparatus are shown in more detail. The launching means 5 comprises a feeding unit 7 and a magazine 8 for ignition pellets 4. The launching means 5 is connected to the guidance tube 6 by means of a  
30 valve 9. The guidance tube 6 is connected with a propulsion gas supply 12 by means of a valve 10 and a reservoir tank 11. The launching means 5 is also connected with a control system 14. If the apparatus is to be used with electrically or mechanically activatable ignition pellets 4, a mechanical  
35 or electric initiator 13 is mounted on the guidance tube 6. The purpose of this initiator 13 will be described in more detail later.



The ignition takes place by an ignition pellet 4 being collected from the magazine 8 and loaded into the launching means 5. From the launching means 5 the ignition pellet 4 will be ejected by means of a propulsion gas, for example pressurized air, having a pressure in the magnitude of 0-20 bar, and propelled further into a tube system 6. After the ignition pellet has left the launching means 5, the latter will be closed off because the valve 9 closes. Additional propulsion gas is supplied by the valve 10 opening and admitting propulsion gas, for example pressurized air, into the tube 6 behind the ignition pellet 4. The valve 10 is connected to a propulsion gas supply 12 which optionally is connected with a propulsion gas tank 11. The ignition pellet 4 will thereafter be pressed forward through the tube system 6 in accordance with the pneumatic post principle. The movement of the ignition pellet 4 in the tube 6 may be stopped, and the ignition pellet 4 may optionally be brought back to the launching means 5 by means of negative pressure.

The ignition pellet 4 may be either electrically or mechanically activated. When electrically activatable ignition pellets 4 are used, these will pass an activator unit 13 consisting, for example, of two contact pieces. Here an electric impulse is applied to the ignition pellet and an electric igniter will start. This is shown in Figures 2, 5 and 6. The ignition pellet 4 may, for example, be designed with an exterior casing 15 and a guide strip 16 which will bear against the tube 6, preventing the propulsion gas to leak past the ignition pellet 4. This is shown on the left side of Figure 6. The exterior casing 15 may be a conductor carrying current and be connected with an igniter 18 inside the ignition pellet. This is shown on the right side of Figure 6.

The interior of the ignition pellet 4 consists of a fire charge 17, an igniter 18 and a spark-forming medium 19. The

igniter 18 may be preprogrammed to go off after a certain period of time.

5 If the ignition pellet 4 is of a mechanically activatable type, the activator unit 13 is unnecessary. When the ignition pellet 4 is fetched from the magazine 8, the pellet 4 will be activated by the removal of the safety device. The ignition pellet 4 is thereafter sent into the guidance tube 6. When the pellet 4 leaves the guidance tube 6, the  
10 pellet is set off by the release of the mechanical safety device. This can be solved, for example, by means of an activator of the hand grenade type. The ignition pellet is programmed for a time delay and may go undergo its reaction either in the middle of the gas cloud or in a basket.

15 Two different ways in which the reaction of the ignition pellet 4 may occur are shown in Figures 3 and 4, one possibility, as shown in Figure 3, being that the ignition pellet 4 continues in a free path into the cloud of gas 1 after it has left the guidance tube 6. The ignition pellet 4  
20 is programmed so that it undergoes a reaction when it is in the middle of the gas cloud 1. The other possibility is that the ignition pellet 4 lands in a basket after it has left the guidance tube 6, as shown in Figure 4. The pellet will then  
25 remain in the basket 20 until its reaction. This solution demands less precision with respect to the time of ignition. The basket 20 is formed so that the sparks will be dispersed in the most favorable area with respect to the ignition of the gas cloud 1.

30 The present invention may also make use of ordinary ignition pellets 4, the reaction of which occurs by impact. In that case there may be used a tube having a length of about 100 m, and a propulsion gas having a low pressure in the  
35 magnitude of 10 - 20 bar. Since the ignition pellets 4 react by impact, an impact plate (not shown) must be mounted at the outlet of the guidance tube 6.

Amended Patent Claims

1.

5 A method for igniting combustible gases (1), for example from  
a flare (2) of a flare tower (3), where an ignition device  
(4) is launched in a direction toward a region of combustible  
gas (1), said ignition device (4) being propelled by means of  
a pressure medium through a guidance tube (6) to said gas  
cloud region (1), the ignition device (4) undergoing a  
10 reaction for the purpose of active ignition of the gas in  
said region, the time for its activation and reaction being  
predetermined and adapted to the particular flare and  
application, and the ignition device (4) being reacted in the  
form of a shower or cloud of sparks, where at least parts of  
15 the shower of sparks strike the gas cloud (1),  
c h a r a c t e r i z e d i n that the ignition device (4)  
is activated somewhere along its path in the tube (6),  
possibly at the moment when the ignition device (4) leaves  
the tube (6) or possibly when the ignition device (4) starts  
20 its course through the tube (6).

2.

A method according to claim 1,  
c h a r a c t e r i z e d i n that the ignition device (4)  
25 is positioned within a trapping device (20) prior to the  
reaction of the ignition device (4).

3.

A method according to claim 1 or 2,  
30 c h a r a c t e r i z e d i n that the ignition device (4)  
may be propelled at a moderate speed through the guidance  
tube (6), that it may optionally be stopped during its  
passage through the tube (6), and that it may optionally be  
reversed and returned back into the guidance tube (6) without  
35 a reaction taking place.

4.

An apparatus to be used for igniting combustible gases (1), for example from a flare (2) of a flare tower (3), by means of an ignition device (4) which is brought toward a region in or near a cloud of gas (1), comprising a guidance tube (6) and a supply of a pressure medium, where the ignition device (4) is adapted for propulsion through the guidance tube (6) by means of the pressure medium for the purpose of bringing the ignition device (4) close to the cloud of gas (1) for reaction near or within the cloud of gas (1), said device further comprising a feeding unit (7), a control device (14) and, optionally, a magazine (8) for the ignition device (4), c h a r a c t e r i z e d i n that an ignition initiator (13) is mounted somewhere along the guidance tube (6), said initiator (13) activating the ignition device (4) which, after a time delay, undergoes a reaction outside the tube, in or near the cloud of gas (1).

5.

An apparatus according to claim 4, c h a r a c t e r i z e d i n that it comprises a trapping device (20) for the ignition device (4), which trapping device (20) is situated outside the tube, whereby the ignition device (4) is positioned within the trapping device (20) prior to the reaction of the ignition device (4).

6.

An ignition device to be used with the apparatus according to claims 4 or 5, c h a r a c t e r i z e d i n that the ignition device is in the form of an ignition pellet (4) which is electrically or mechanically activated, said activation occurring somewhere along its path in the tube (6), possibly at the moment when the ignition pellet (4) leaves the tube (6), possibly when the ignition pellet (4) starts its course through the tube (6), said ignition pellet (4) having a built-in delay prior to its reaction, and the time for its

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activation and delay being predetermined and adapted to the particular flare and application.

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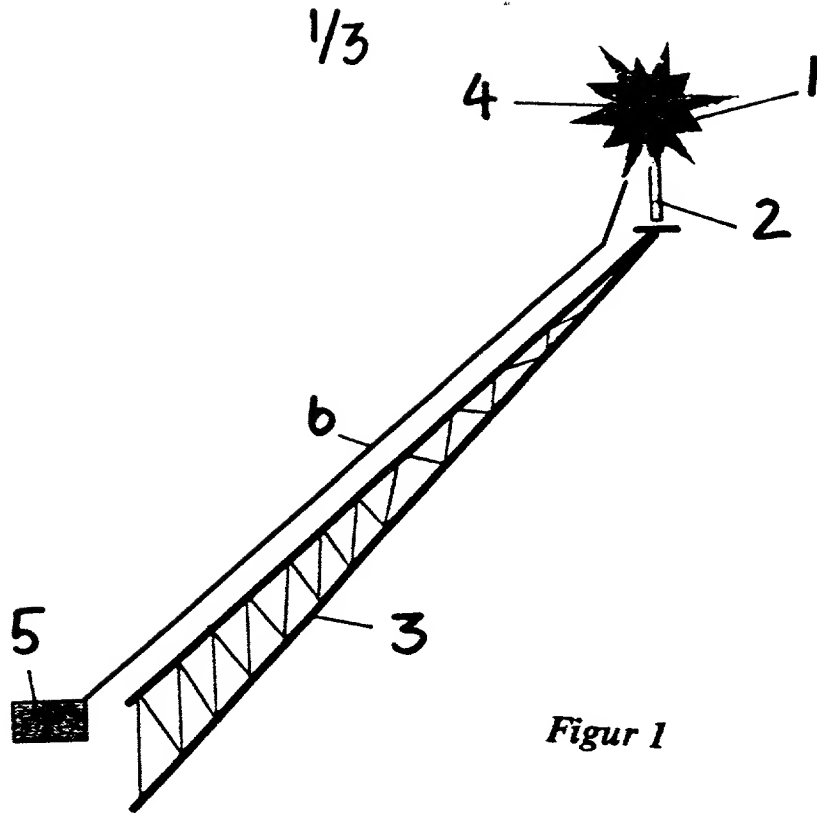
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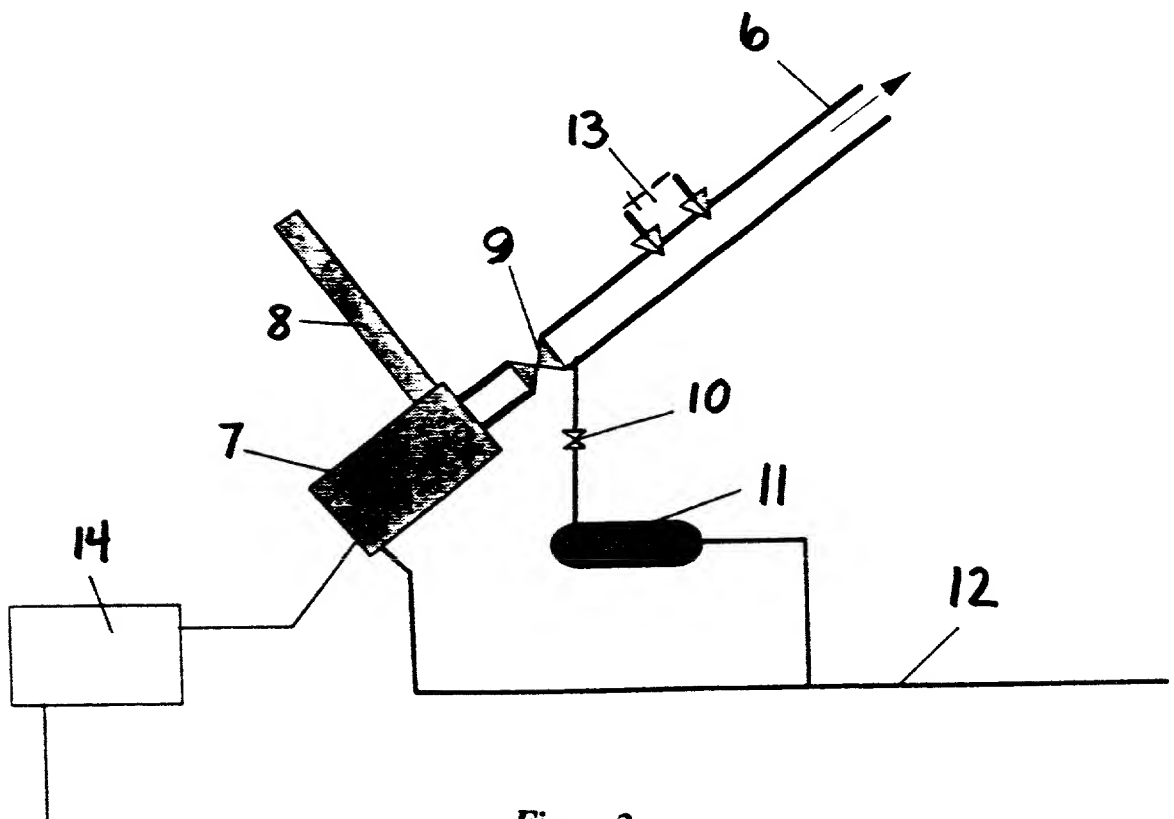
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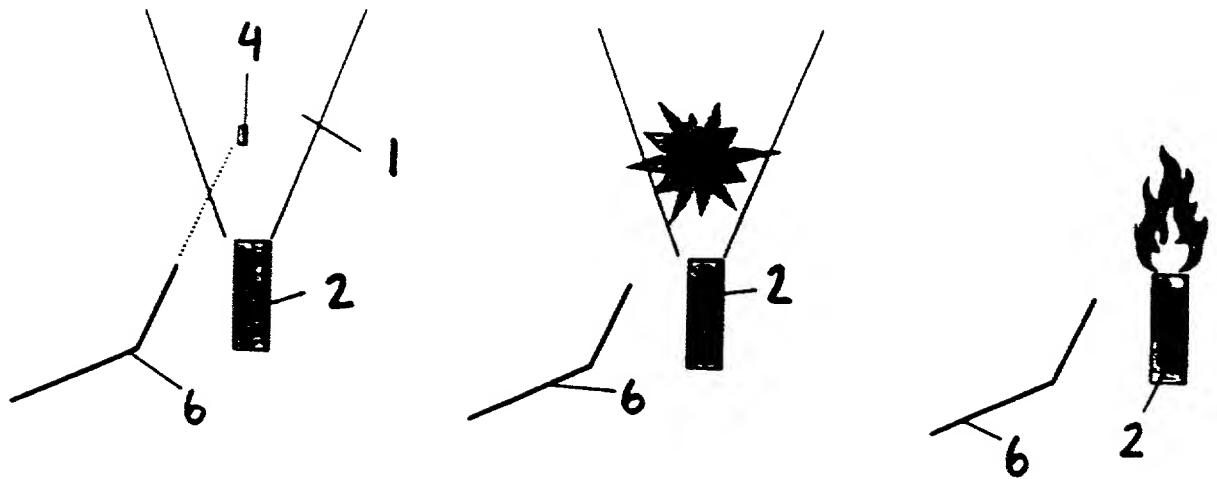
Figur 1



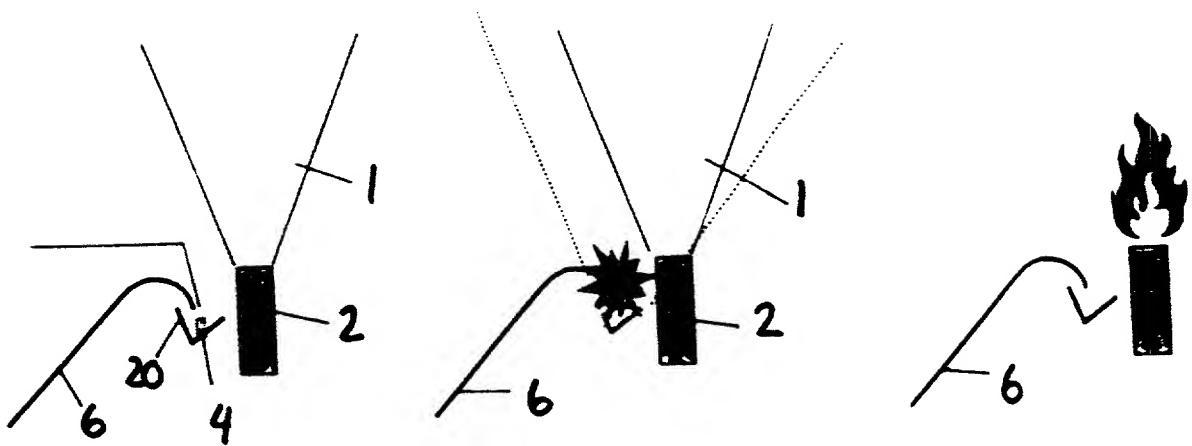
Figur 2

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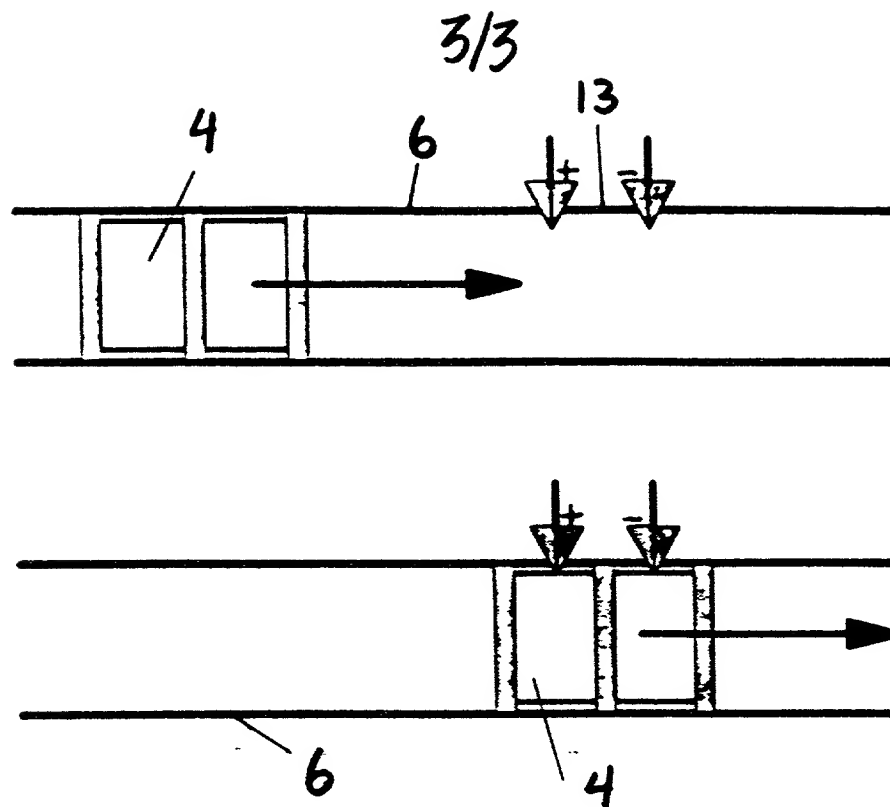
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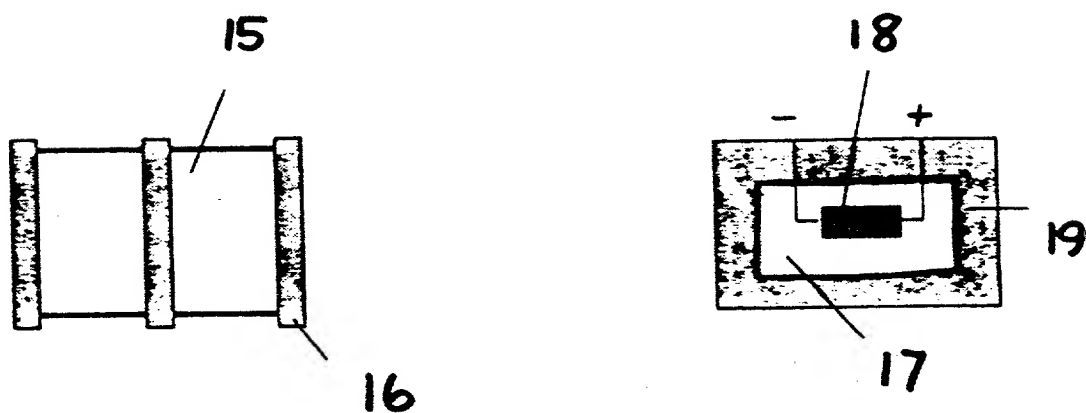
Figur 3



Figur 4



Figur 5



Figur 6



As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the INVENTION ENTITLED METHOD; APPARATUS AND IGNITION  
DEVICE FOR IGNITION OF INFLAMMABLE GASES FROM A FLARE ON E.G. A FLAME TOWER

the specification of which (CHECK applicable BOX(ES))

-> [ ] is attached hereto.

-> [ ] was filed on \_\_\_\_\_ as U.S. Application No. 0 / \_\_\_\_\_

BOX(ES) -> [X] was filed as PCT International Application No. PCTNO95 / 00183 on 09.10.1995

-> -> and (if applicable to U.S. or PCT application) was amended on 09.10.1996

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application:

PRIOR FOREIGN APPLICATION(S)

Number	Country	Day/MONTH/Year Filed	Date first Laid-open or Published	Date Patented or Granted	Priority Claimed Yes No
943851	Norway	12.10.1994			X

I hereby claim domestic priority benefit under 35 U.S.C. 120/365 of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application:

PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S)

Application No. (series code/serial no.)	Day/MONTH/Year Filed	Status pending, abandoned, patented	Priority Claimed Yes No
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint Cushman Darby & Cushman Intellectual Property Group of Pillsbury Madison & Sutro LLP, 1100 New York Avenue, N.W., Ninth Floor, East Tower, Washington, D.C. 20005-3918, telephone number (202) 861-3000 (to whom all communications are to be directed), and the below-named persons (of the same address) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete names/numbers below of persons no longer with their firm and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above Firm and/or a below attorney in writing to the contrary.

Paul N. Kokulis	16773	David W. Brinkman	20817	Chris Comuntzis	31097	David A. Jakopin	32995
Raymond F. Lippin	17519	George M. Sirilla	18221			Mark G. Paulson	30793
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William K. West, Jr.	22057	Dale S. Lazar	28827			Stephen C. Glazier	31361
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1. INVENTOR'S SIGNATURE:

Inventor's Name (typed) Tom Odemark Date 04.03.1997  
 Residence (City) HOSLE, NORWAY (State/Foreign Country) NORWAY Family Name NORWAY Country of Citizenship NORWAY  
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2. INVENTOR'S SIGNATURE:

Inventor's Name (typed) Sjur Dagestad Date 04.03.97  
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3. INVENTOR'S SIGNATURE:

Inventor's Name (typed) \_\_\_\_\_ Date \_\_\_\_\_  
 Residence (City) \_\_\_\_\_ (State/Foreign Country) \_\_\_\_\_ Family Name \_\_\_\_\_ Country of Citizenship \_\_\_\_\_  
 Post Office Address (Include Zip Code) \_\_\_\_\_

(FOR ADDITIONAL INVENTORS, check box [ ] and attach sheet (CDC-116.2) for same information for each re signature, name, date, citizenship, residence and address.)

Applicant or Patentee Tom ØDEMARK et al

Attorney's

Serial or Patent No.:

Docket No. M# 237370

Filed or Issued: April 11, 1997

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9 AND 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

- ☒ the owner of the small business concern identified below;  
☐ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN \_\_\_\_\_

ADDRESS OF CONCERN \_\_\_\_\_

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled METHOD; APPARATUS AND IGNITION DEVICE FOR IGNITION OF INFLAMMABLE GASES FROM A FLARE ON E.G. A FLAME TOWER by inventor(s) \_\_\_\_\_ described in

☒ the specification filed herewith.

☐ application Serial No. \_\_\_\_\_, filed April 11, 1997.

☐ patent no. \_\_\_\_\_, issued \_\_\_\_\_.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\* NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities (37 CFR 1.27).

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Arne øie

TITLE OF PERSON OTHER THAN OWNER Managing director of TC

ADDRESS OF PERSON SIGNING Storengveien 4 A, N-1315 Nesøya, Norway

SIGNATURE Arne øie

DATE 04.03.97

(Arne øie)